FIG. 1

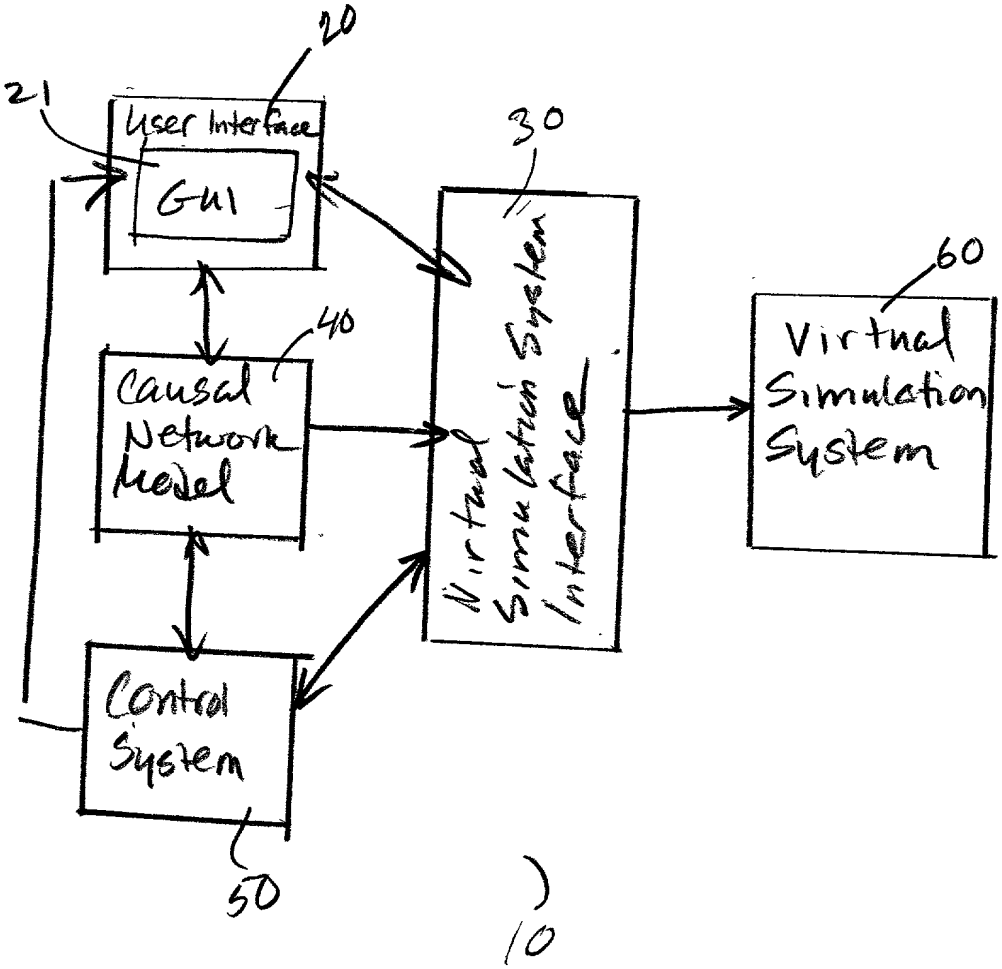
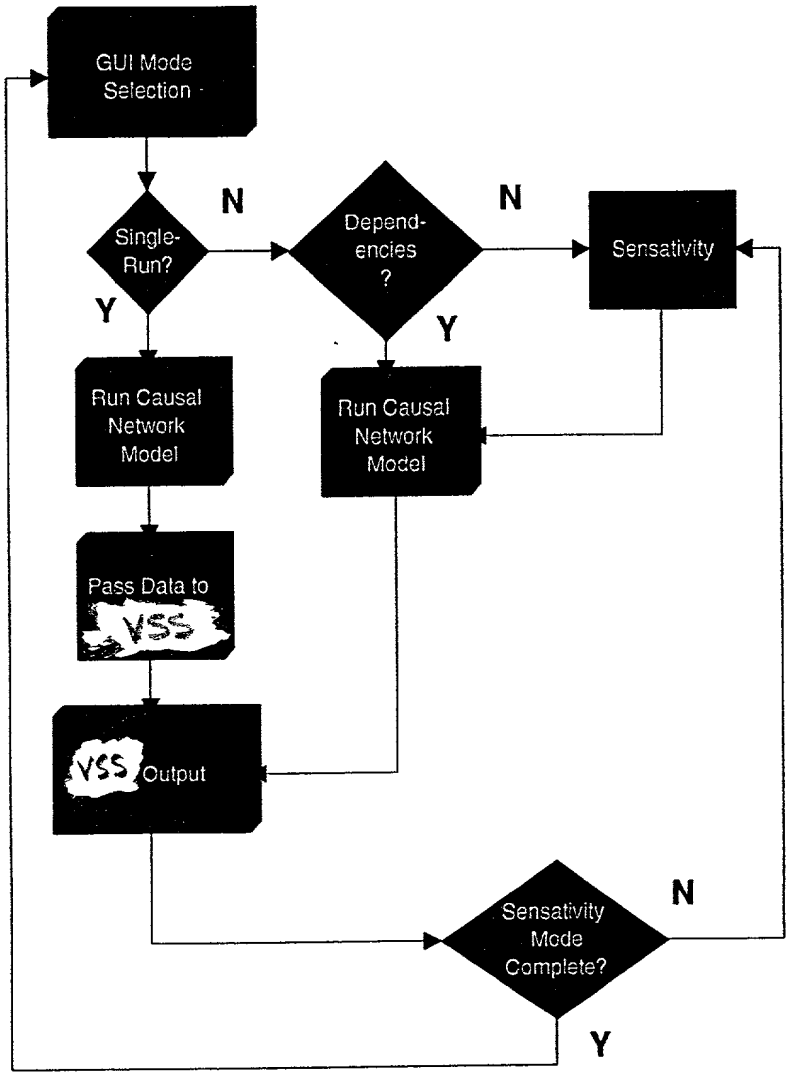

20
21
User Interface
GUI
30
60
40
Causal Network Model
Virtual Simulation System
Virtual Simulation System Interface
Control System
50
10

FIG. 2



151

VSS = Virtual simulation system
gui = graphics user interface

FIG. 3

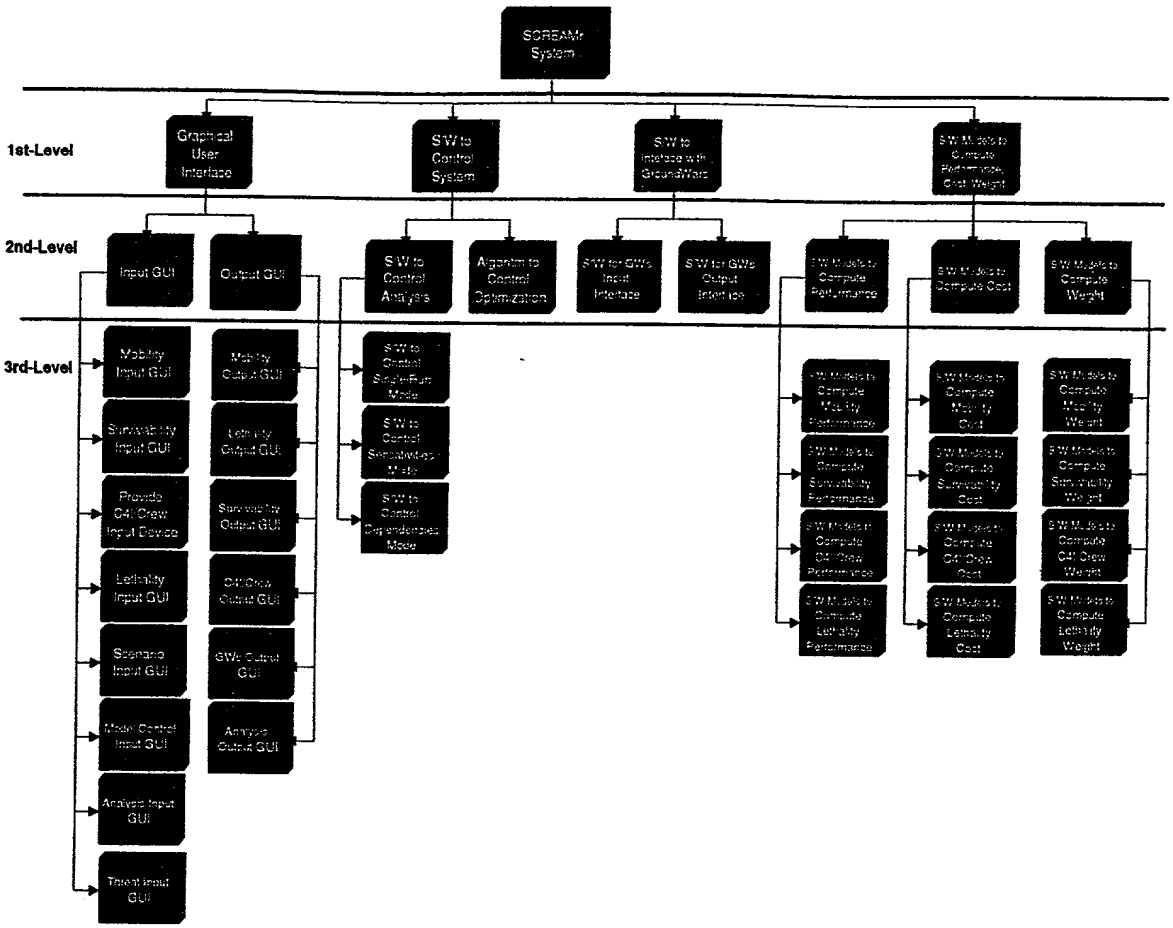

SOREAMr System
1st-Level
Graphical User Interface
S/W to Control System
S/W to Interface with Ground/Warc
S/W Models to Compute Performance, Cost, Weight
2nd-Level
Input GUI
Output GUI
S/W to Control Analyses
Algorithm to Control Optimization
S/W for GWs Input Interface
S/W for GWs Output Interface
S/W Models to Compute Performance
S/W Models to Compute Cost
S/W Models to Compute Weight
3rd-Level
Mobility Input GUI
Survivability Input GUI
Provide C4I Crew Input Device
Lethality Input GUI
Scenario Input GUI
Mode Control Input GUI
Analysis Input GUI
Talent Input GUI
Mobility Output GUI
Lethality Output GUI
Survivability Output GUI
C4I/Crew Output GUI
GWs Output GUI
Analysis Output GUI
S/W to Control Single-Run Mode
S/W to Control Sensitivities Mode
S/W to Control Ongoendesign Mode
S/W Models to Compute Mobility Performance
S/W Models to Compute Survivability Performance
S/W Models to Compute C4I/Crew Performance
S/W Models to Compute Lethality Performance
S/W Models to Compute Mobility Cost
S/W Models to Compute Survivability Cost
S/W Models to Compute C4I/Crew Cost
S/W Models to Compute Lethality Cost
S/W Models to Compute Mobility Weight
S/W Models to Compute Survivability Weight
S/W Models to Compute C4I/Crew Weight
S/W Models to Compute Lethality Weight

FIG. 4

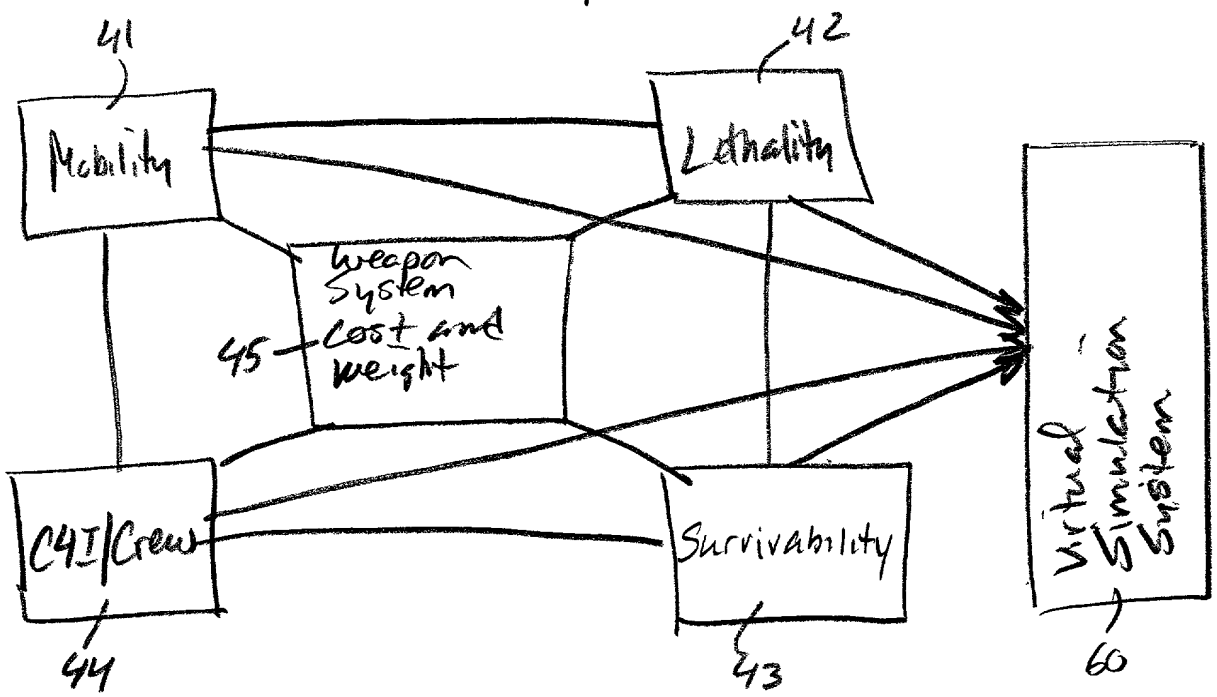

41
Mobility
42
Lethality
Weapon System Cost and Weight
45
C4I/Crew
44
Survivability
43
Virtual Simulation System
60
40

FIG. 5

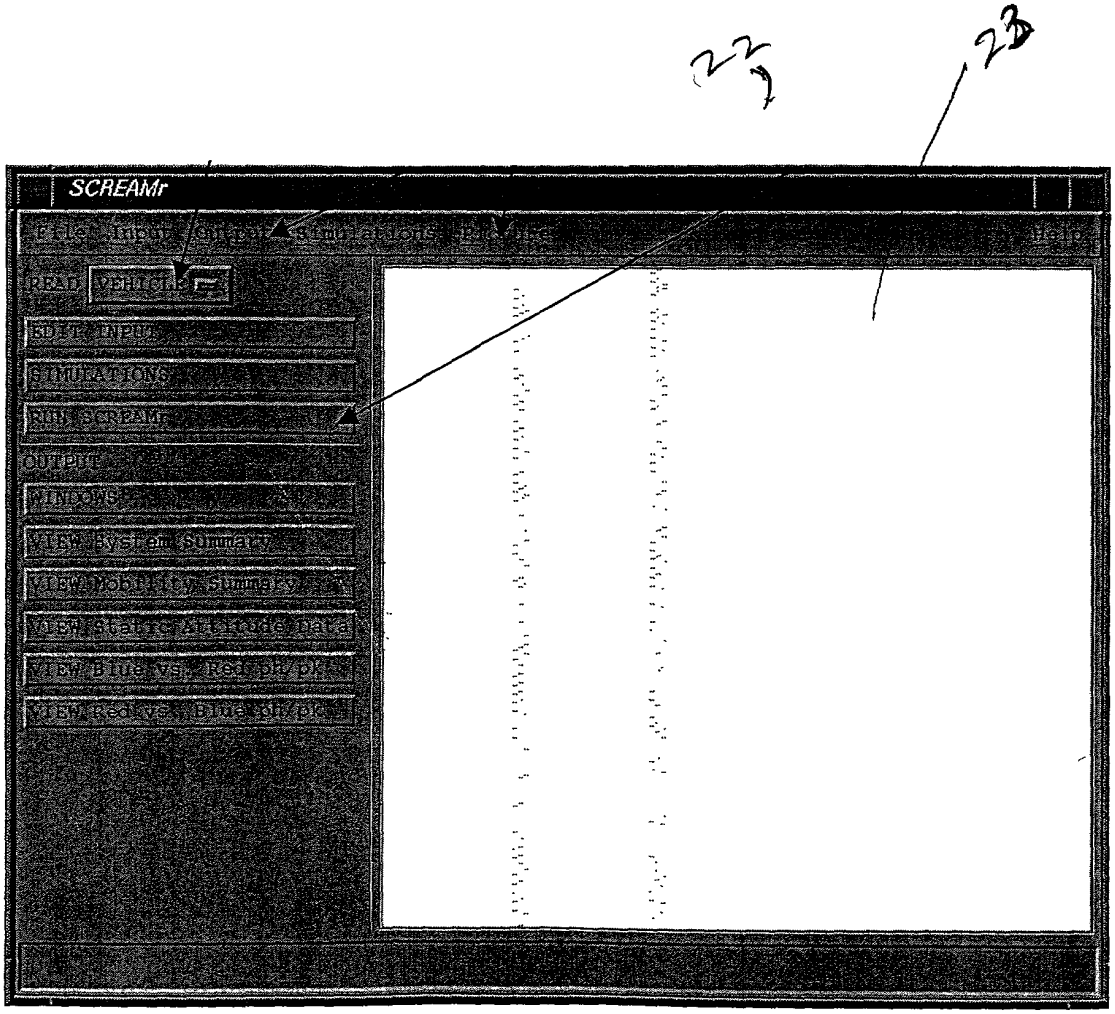

22
23
SCREAMr
File Input Support Simulations Plotting Help
READ
EDIT INPUT
SIMULATIONS
RUN SCREAMr
OUTPUT
WINDOWS
VIEW System Summary
VIEW Mobility Summary
VIEW Starter Attitude Data
VIEW Blue vs. Red pk/pk
VIEW Red vs. Blue pk/pk

FIG. 6

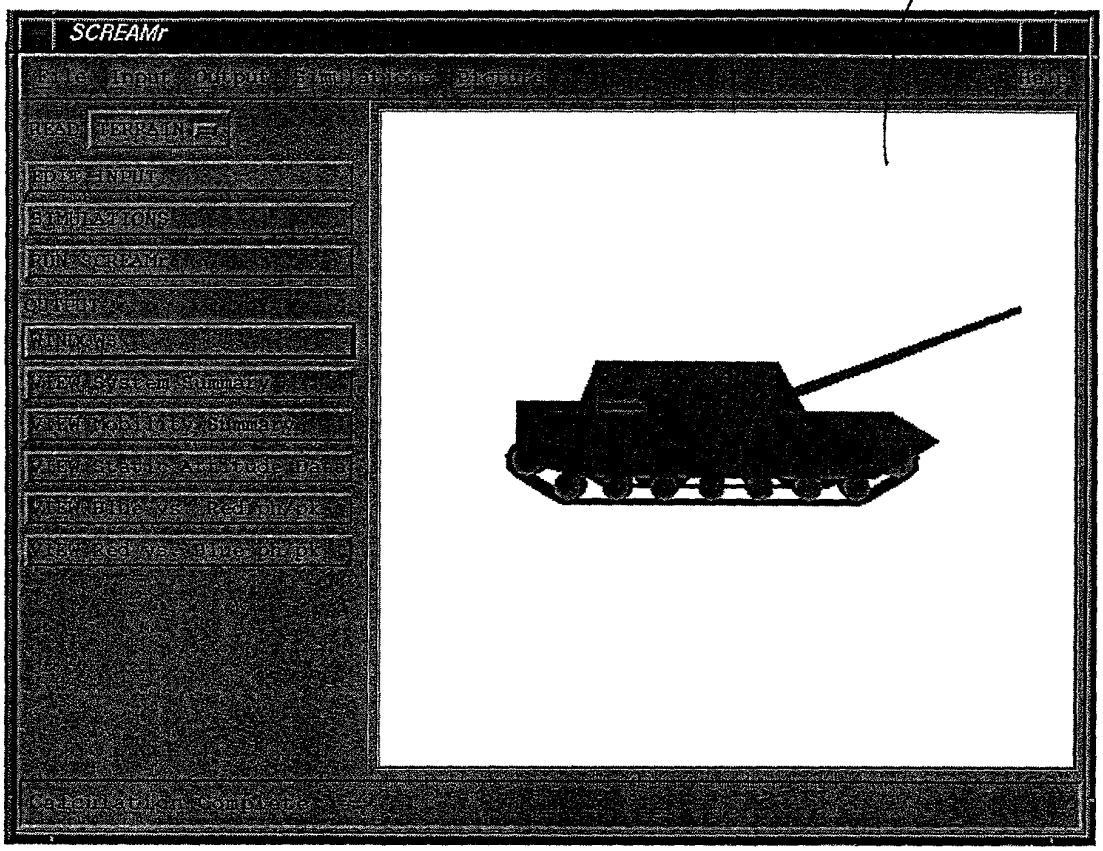

22
23
SCREAMr

FIG. 7

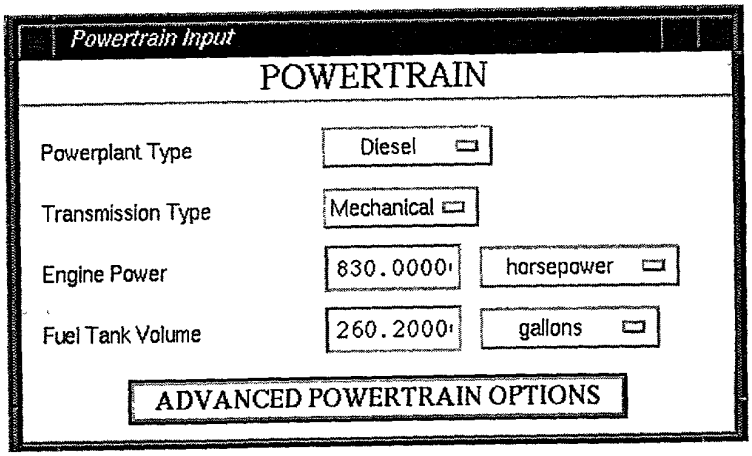

Powertrain Input
POWERTRAIN
Powerplant Type
Diesel
Transmission Type
Mechanical
Engine Power
830.0000
horsepower
Fuel Tank Volume
260.2000
gallons
ADVANCED POWERTRAIN OPTIONS

FIG. 8

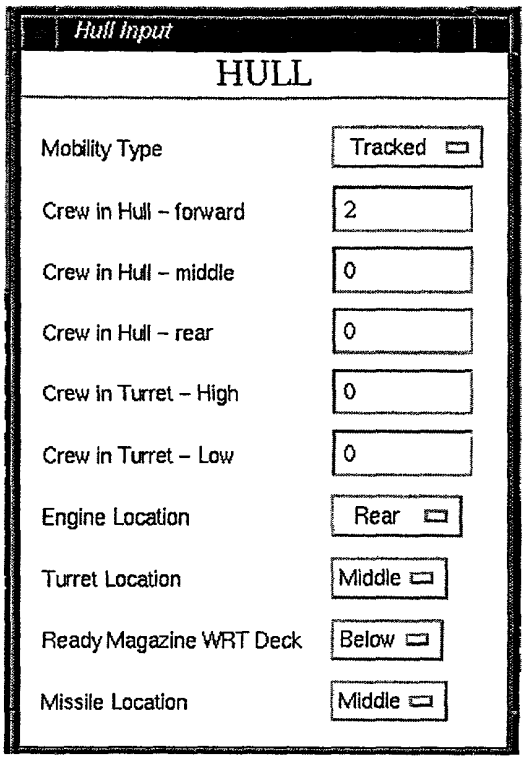

Hull Input
HULL
Mobility Type
Tracked
Crew in Hull – forward
2
Crew in Hull – middle
0
Crew in Hull – rear
0
Crew in Turret – High
0
Crew in Turret – Low
0
Engine Location
Rear
Turret Location
Middle
Ready Magazine WRT Deck
Below
Missile Location
Middle

FIG. 9

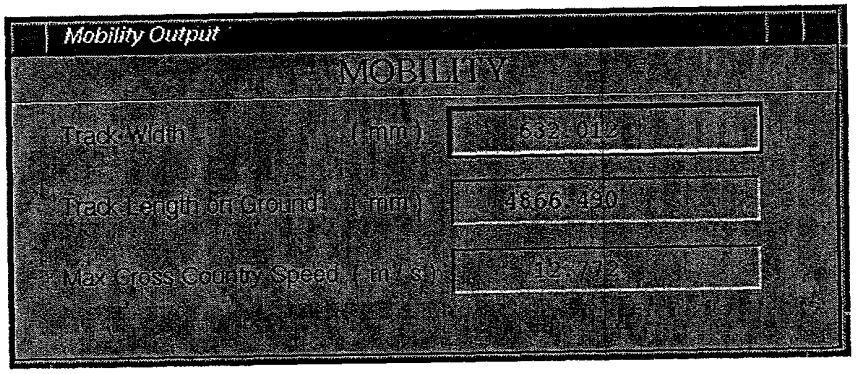

Mobility Output
MOBILITY
Track Width (mm)
Track Length on Ground (mm)
Max Cross Country Speed (m/s)

FIG. 10

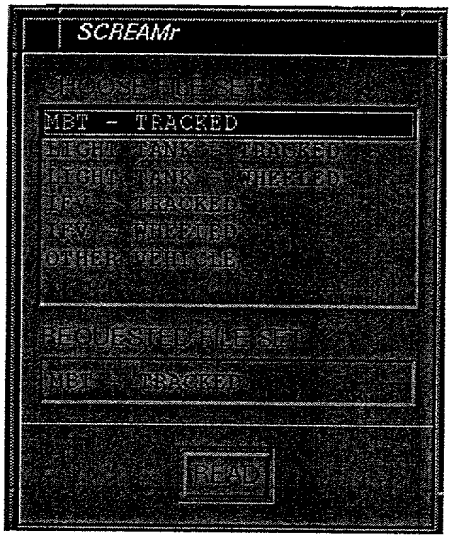

SCREAMr
MBT - TRACKED
READ

FIG. 11

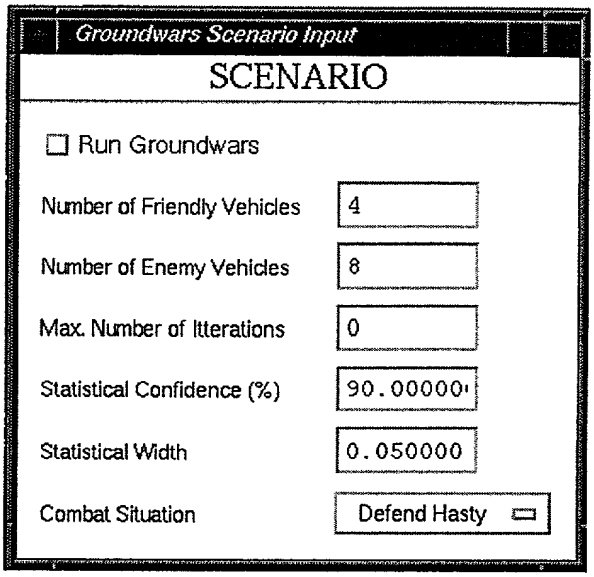

Groundwars Scenario Input
SCENARIO
Run Groundwars
Number of Friendly Vehicles
4
Number of Enemy Vehicles
8
Max. Number of Itterations
0
Statistical Confidence (%)
90.00000
Statistical Width
0.050000
Combat Situation
Defend Hasty

FIG. 12

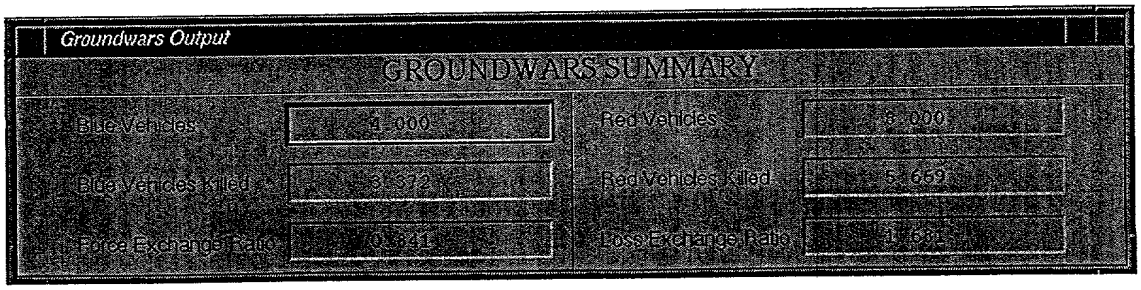

Groundwars Output
GROUNDWARS SUMMARY
Blue Vehicles
9,000
Blue Vehicles Killed
3,372
Force Exchange Ratio
0.41
Red Vehicles
8,000
Red Vehicles Killed
5,659
Loss Exchange Ratio

FIG. 13

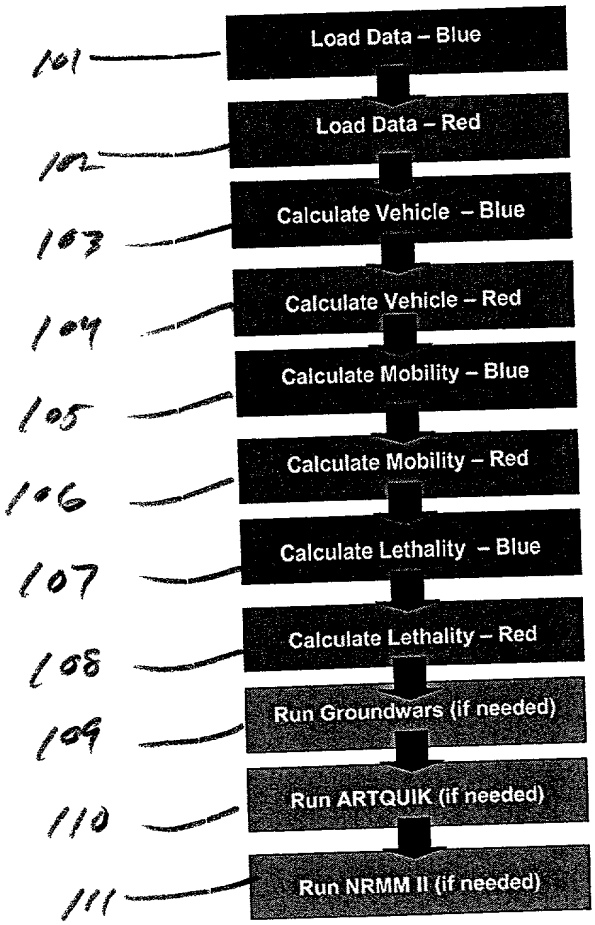

101
Load Data – Blue
102
Load Data – Red
103
Calculate Vehicle – Blue
104
Calculate Vehicle – Red
105
Calculate Mobility – Blue
106
Calculate Mobility – Red
107
Calculate Lethality – Blue
108
Calculate Lethality – Red
109
Run Groundwars (if needed)
110
Run ARTQUIK (if needed)
111
Run NRMM II (if needed)

FIG. 14

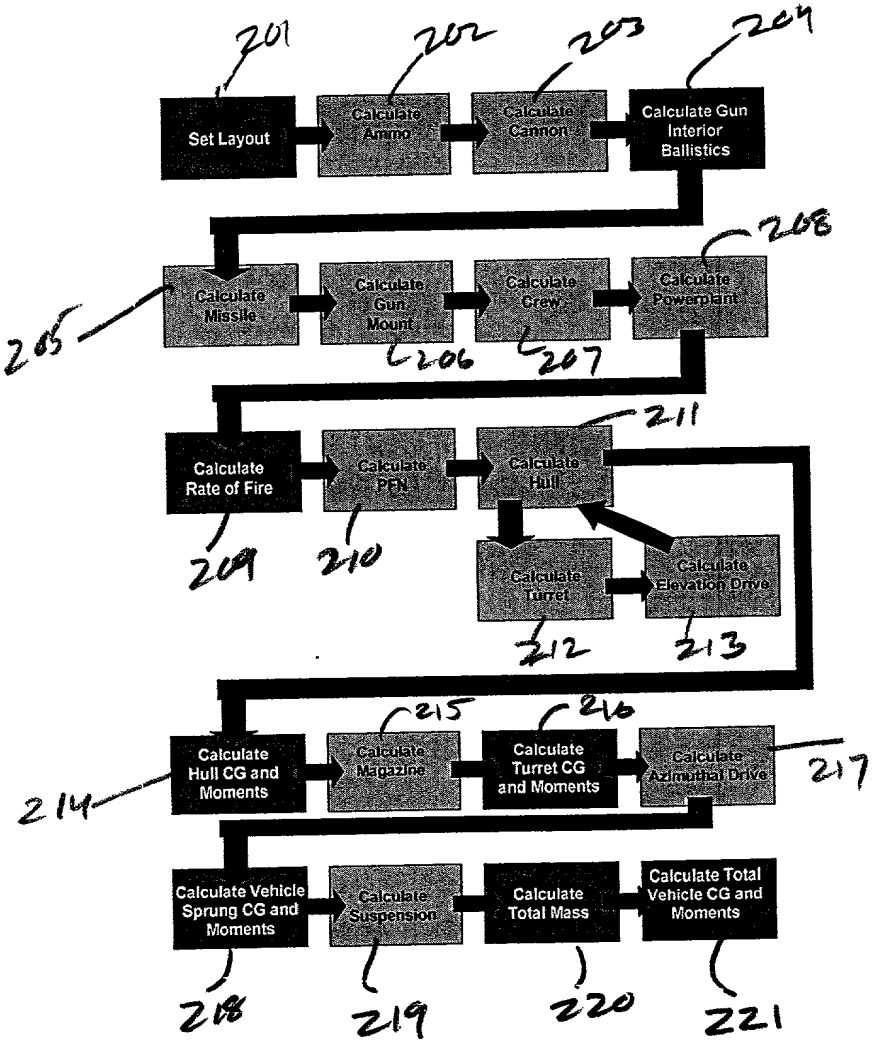

201
202
203
204
Set Layout
Calculate Ammo
Calculate Cannon
Calculate Gun Interior Ballistics
205
Calculate Missile
Calculate Gun Mount
206
Calculate Crew
207
208
Calculate Powerplant
Calculate Rate of Fire
209
Calculate PEN
210
Calculate Hull
211
Calculate Turret
212
Calculate Elevation Drive
213
214
Calculate Hull CG and Moments
215
Calculate Magazine
216
Calculate Turret CG and Moments
Calculate Azimuthal Drive
217
Calculate Vehicle Sprung CG and Moments
218
Calculate Suspension
219
Calculate Total Mass
220
Calculate Total Vehicle CG and Moments
221

FIG. 15

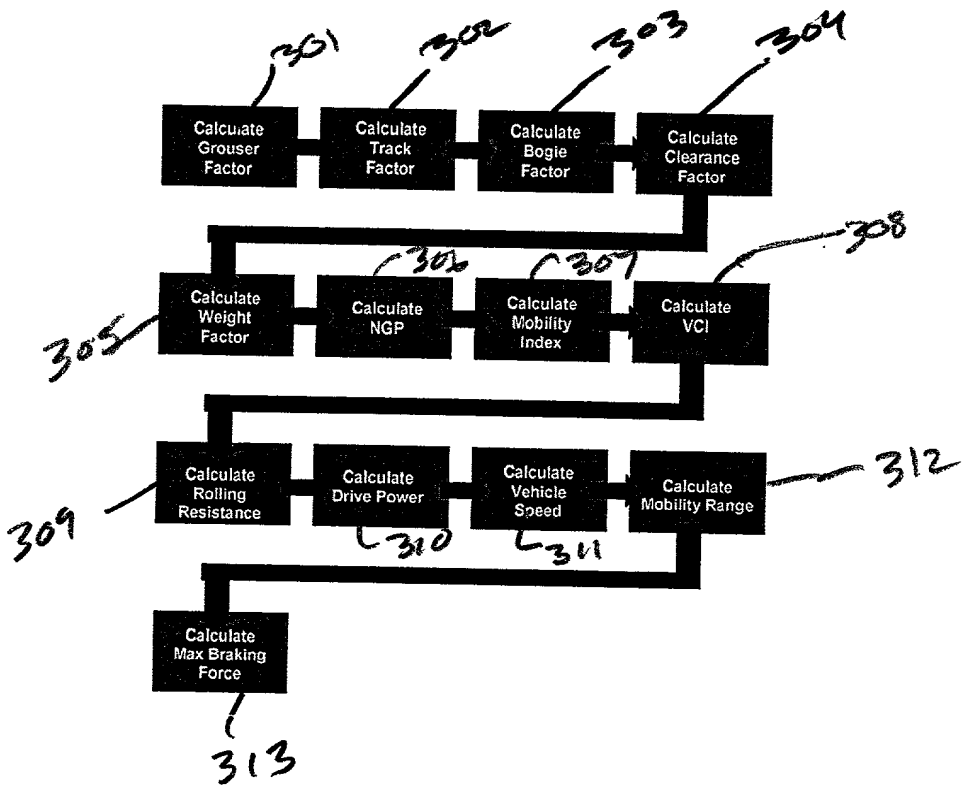
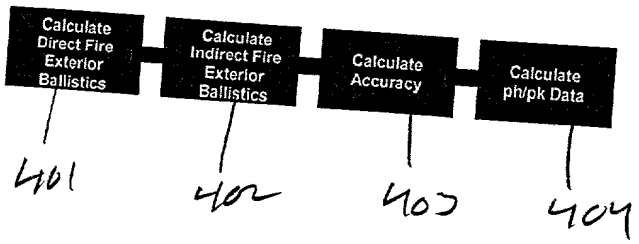
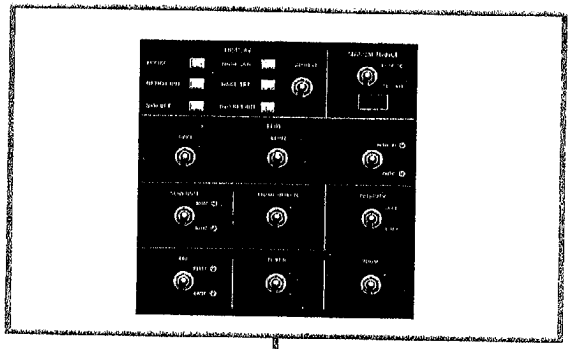
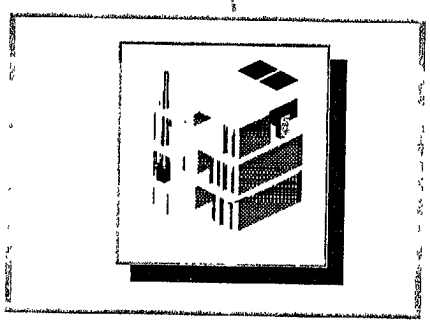

Calculate Grouser Factor
Calculate Track Factor
Calculate Bogie Factor
Calculate Clearance Factor
Calculate Weight Factor
Calculate NGP
Calculate Mobility Index
Calculate VCI
Calculate Rolling Resistance
Calculate Drive Power
Calculate Vehicle Speed
Calculate Mobility Range
Calculate Max Braking Force
301
302
303
304
305
306
307
308
309
310
311
312
313

FIG. 16

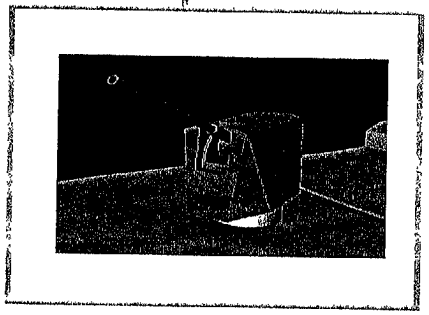

Calculate Direct Fire Exterior Ballistics
Calculate Indirect Fire Exterior Ballistics
Calculate Accuracy
Calculate ph/pk Data
401
402
403
404



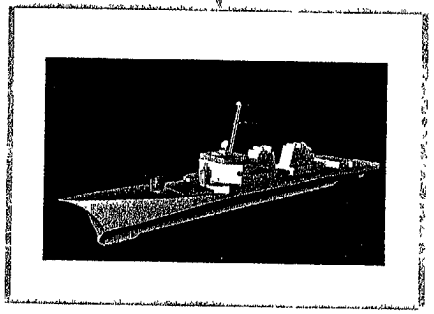
Tcl/Tk Control Panel
DIADEM Real-Time
State Machine
(Sun Ultra Sparc)



EAI Magazine Model
with ERGM and Propellant
(SGI)



EAI Gun and Loader
(SGI)



Coryphaeus Flyout
and System Effectiveness
(SGI)

FIG. 17

Company Private

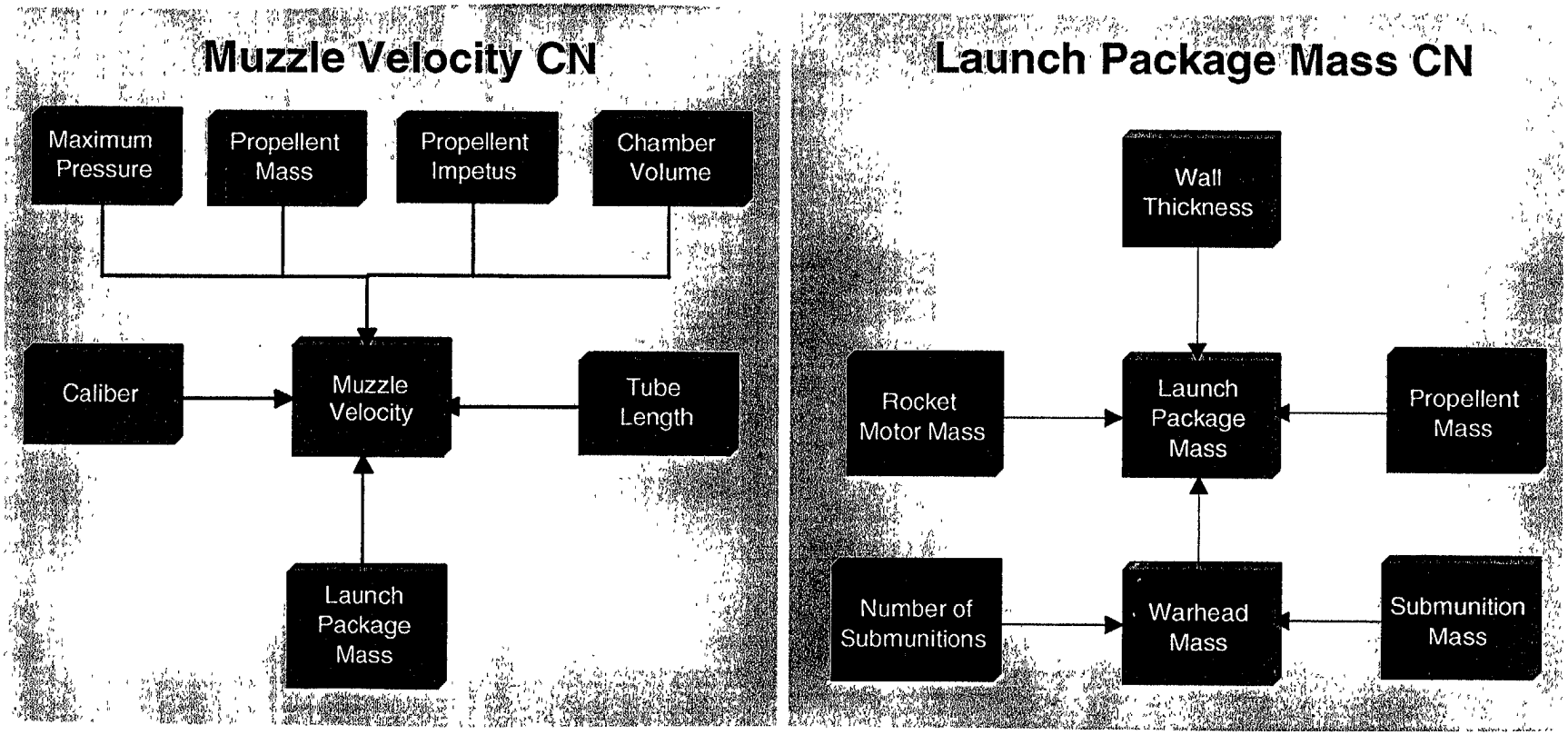
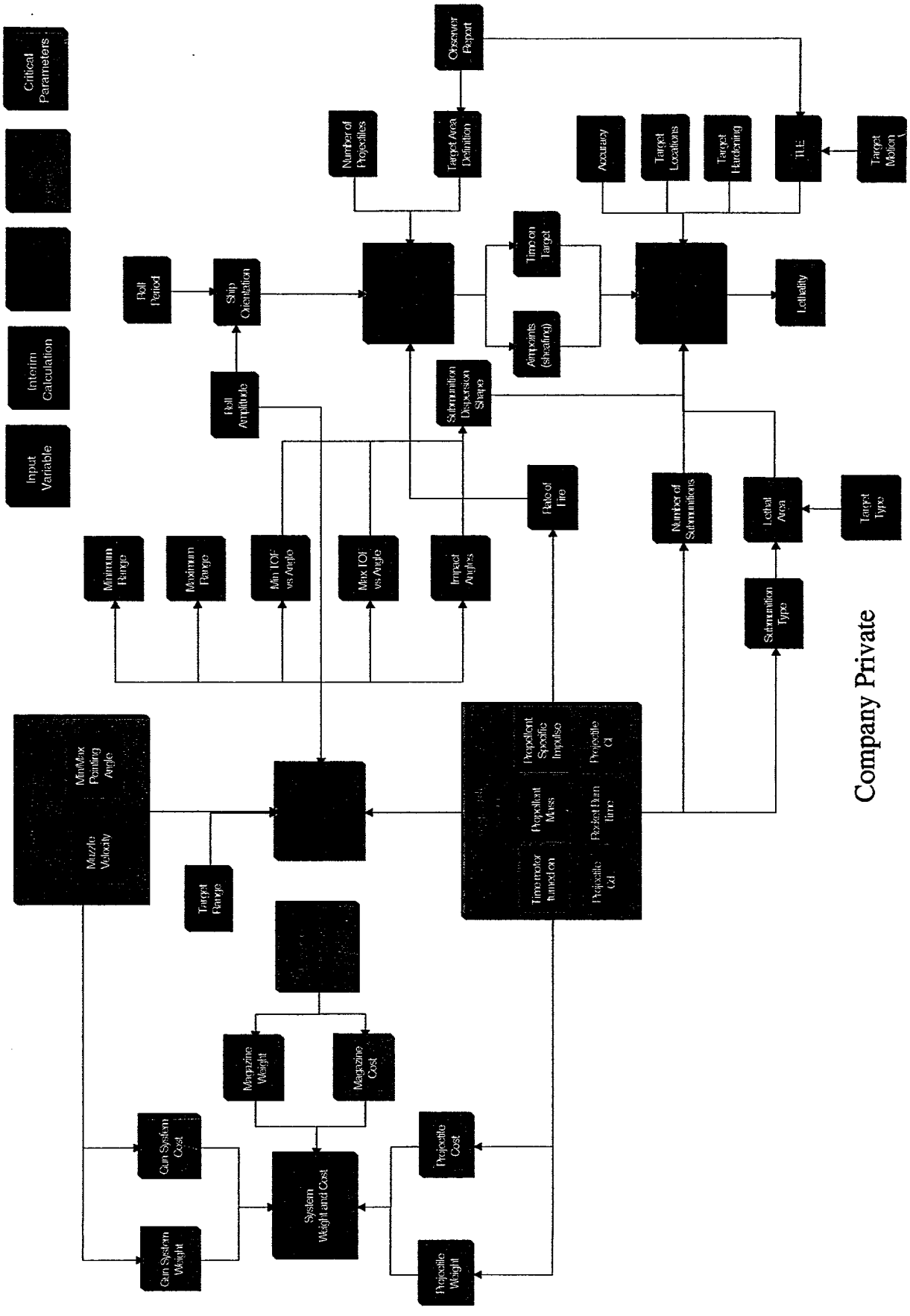

Muzzle Velocity CN
Maximum Pressure
Propellent Mass
Propellent Impetus
Chamber Volume
Caliber
Muzzle Velocity
Tube Length
Launch Package Mass
Launch Package Mass CN
Wall Thickness
Rocket Motor Mass
Launch Package Mass
Propellent Mass
Number of Submunitions
Warhead Mass
Submunition Mass

FIG. 18

FIG. 19


Critical Parameters
Interim Calculation
Input Variable
Observer Report
Number of Projectiles
Target Area Definition
Accuracy
Target Locations
Target Hardening
TLE
Target Motion
Roll Period
Skip Orientation
Time on Target
Aimpoints (shooting)
Lethality
Roll Amplitude
Submunition Dispersion Shape
Rate of Fire
Number of Submunitions
Lethal Area
Target Type
Minimum Range
Maximum Range
Min TOF vs Angle
Max TOF vs Angle
Impact Angles
Submunition Type
Min/Max Pointing Angle
Muzzle Velocity
Propellant Specific Impulse
Projectile Cd
Propellant Mass
Projectile Mass
Projectile Cd
Target Range
Magazine Weight
Magazine Cost
Gun System Cost
Gun System Weight
System Weight and Cost
Projectile Cost
Projectile Weight
Company Private

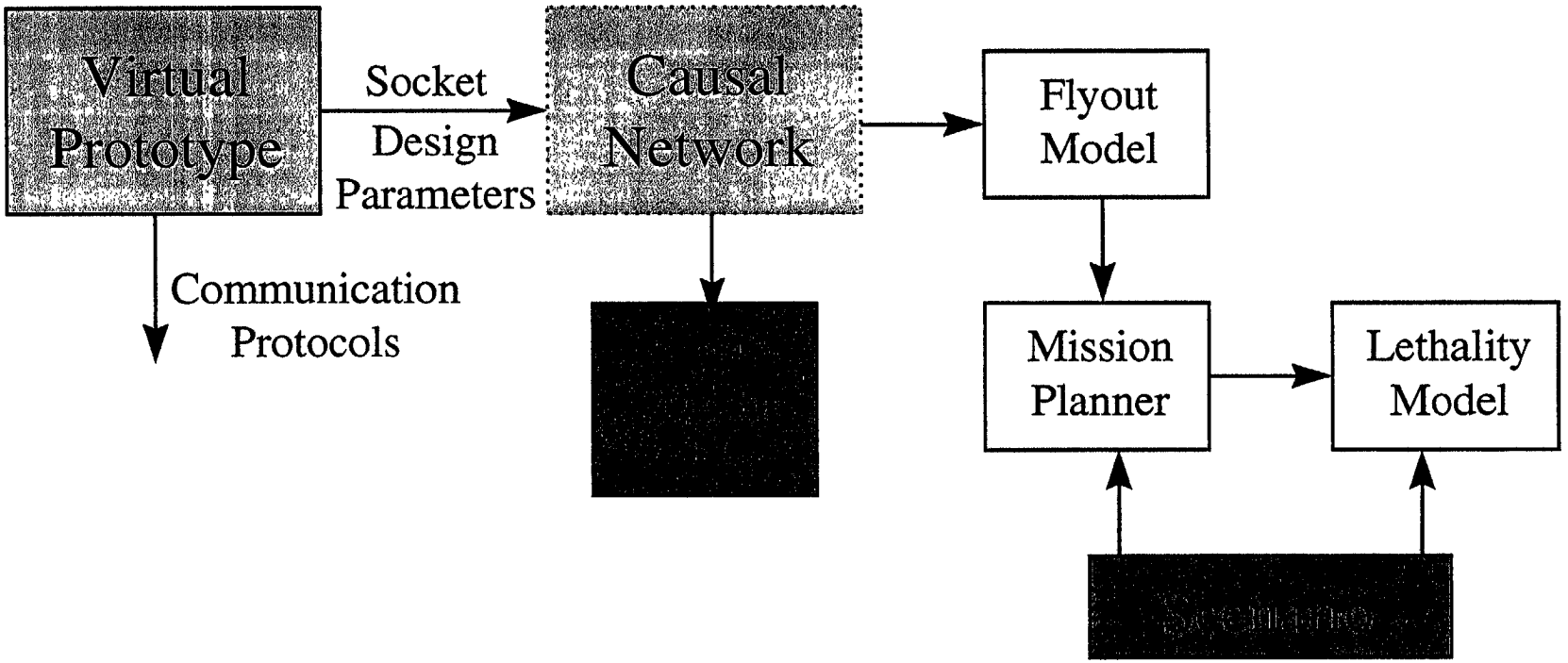
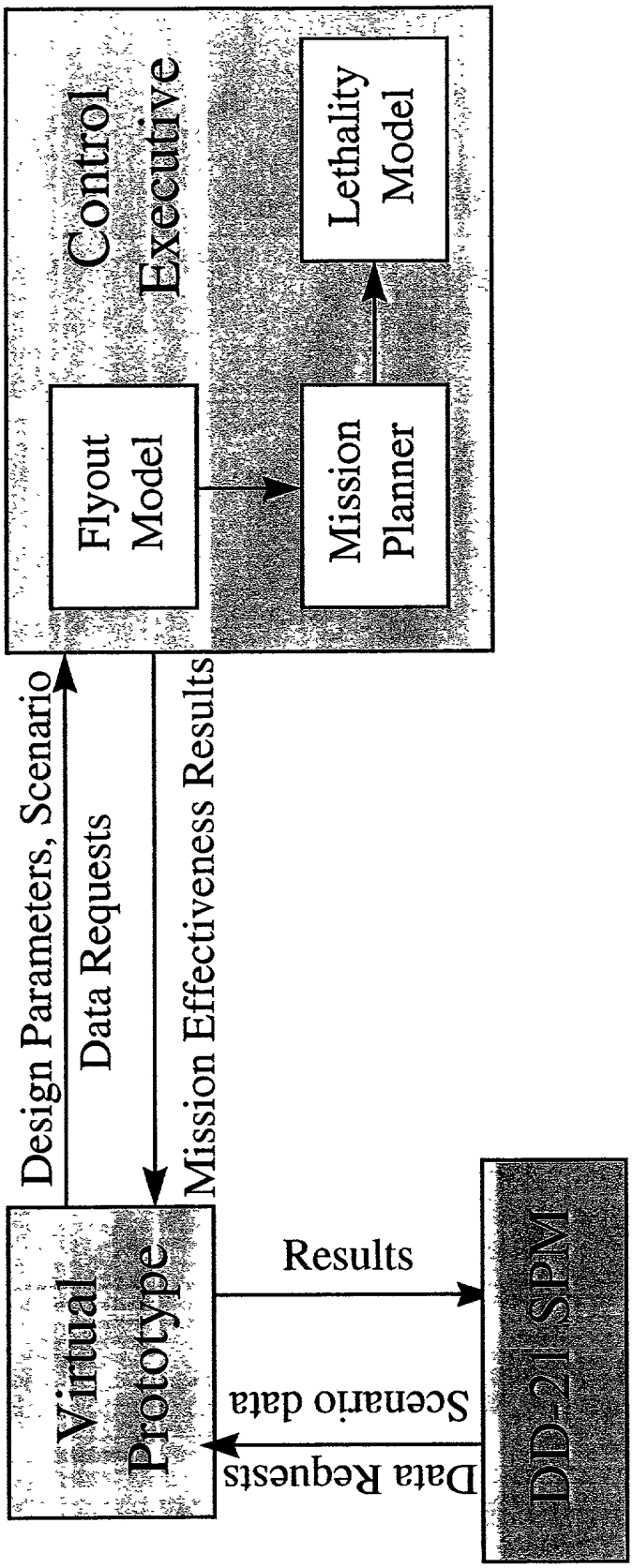

Virtual Prototype
Socket
Design Parameters
Causal Network
Flyout Model
Communication Protocols
Mission Planner
Lethality Model

FIG. 20

FIG. 21


Control Executive
Flyout Model
Mission Planner
Lethality Model
Design Parameters, Scenario
Data Requests
Mission Effectiveness Results
Virtual Prototype
Results
Scenario data
Data Requests
DD-21 SPM